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LIFE-HISTORY OF THE COW GRASSHOPPER (CHRYSOCHRAON ABDOMINALIS THOM.) IN MANITOBA.*

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The name cow grasshopper has been chosen for this insect because of the habit of the female in selecting cattle "chips" or dung in which to place her eggs. On account of this habit, cattle have become an important factor in the spread and perpetuation of the grasshopper and to associate it with the name of its unconscious benefactor seems appropriate.

The cow grasshopper is a somewhat unobtrusive species which appears to depend a good deal upon its colour resemblance to surrounding objects to avoid its enemies. It is present locally over most of southern Manitoba at least as far north as Swan River. It has been taken at the last named place, and at Sandilands in the east, among open pine woods. Elsewhere, it frequents sandy uplands or the margins of poplar woods. In other words it appears to be adaptable to a wide range of territory but is restricted by its egg-laying peculiarities.

In its adult state *Chrysochraon abdominalis* Thom. is very like *Chloealtis consperca* Harr. and it was, until recently, placed in the same genus. It can be recognized at once, however, by the rounded posterior margin of the pronotal disk which in *C. consperca* is almost transverse. Both sexes have somewhat aborted tegmina, those of the female being often quite rudimentary. This feature combined with the much larger size of the female gives the sexes quite a dissimilar appearance. Occasionally, however, long winged forms are met with and in our breeding studies a fair percentage of the females had tegmina which exceeded the abdomen in length.

Like its associate *C. consperca*, the cow grasshopper is somewhat exclusive in its selection of a site for egg-laying and instead of placing its eggs in the ground, as most other Acridinae do, it prefers to deposit them in some tougher substance, such as animal dung or decaying wood. We have recovered the eggs from semi-dry cattle, horse and moose droppings and more sparingly in decayed wood.

It seems probable that this species was once rather closely associated with the buffalo to which it was indebted for material in which to place its eggs. Later the destruction of the mammal deprived the grasshopper of one of its chief sources of perpetuation and as a result it became restricted both in range and numbers. The introduction of horses, in a measure, compensated for the loss of the buffalo but it was only with the development of cattle raising that the insect was again able to spread over its former ranges. It might be thought that this is mere surmise but a survey of areas in which catttle are present, or absent, fully bears out these conclusions.

*—Contribution from the Division of Field Crops and Garden Insects, Entomological Branch, Department of Agriculture, Ottawa.

The music of the cow grasshopper is very like that of *C. consperca.* As a rule the notes appear to be repeated more quickly and they seem, on an average, to be louder, but temperature has so much to do with the volume and quickness of orthopteran music that it is difficult, without having the musicians side by side, to differentiate accurately between them. The notes can be brought to mind by the syllables—*zeete-zeete-zeete* repeated from six to a dozen times. Both species may be found together but *Chrysochraon* is later in maturing, and in autumn its notes are heard long after *Chloealtis* has fallen by the wayside. Indeed, we have found this species playing its instruments even after an early snowstorm, and it is only when winter is very near that the musician is finally subdued.

In selecting a situation for egg-laying, the female grasshopper exhibits all the usual discriminations of her kindred; she hastens from one place to another and tests many objects of possible suitability before finally becoming satisfied. This search for an appropriate situation may continue for an hour or more during which time much territory is covered and many holes are commenced and abandoned. Ultimately a satisfactory place is discovered and the work of drilling and egg-laying is finally accomplished. Should the substance be soft into which the insect has to work her abdomen, the time of drilling and oviposition may not exceed half an hour but if it is hard the operation may be prolonged for at least an hour and a half. Having finished her egg-laying, the grasshopper next attempts to cover the hole by kicking the excavated dust into it and then, having more or less succeeded in this, hops quickly away.

The seven to twelve eggs, deposited at one time, are firmly cemented together with course webbing and are placed in a narrow, flimsy sac approximately 19 mm. in length, the upper tenth of which is empty. At least 100 eggs are laid by each female during her natural life. A detailed description of the various instars follows:—

Egg.—Small of the usual shape, reticulation of medium size, the separating lines stout and minutely tuberculate or hespid, the cross lines finer. Colour pale brown, darker at the anterior end; posterior cap separated by a narrow, smooth ring; length 5 mm.

The eggs begin to hatch in late May and often continue to do so up to the middle of June.

First Instar.—A pale creamy-white nymph with dull brown markings and conspicuously contrastingly coloured hind tibiae and tarsi which give the insect an appearance of having black socks and white shoes. Antennae with 13 seg-

ments, acuminate, much flattened above, obtusely keel-shaped below: Head large, arched above, oblique, almost straight in front; frontal costa narrow, tapering to a point at vertex and dilated ventrally; vertex angulate, obtuse at tip, the apical margin elevated. Pronotum shorter than head; median carina moderately elevated, more so on prozona than metazona, entire; lateral carinae straight somewhat converging posteriorly and with an inward indentation slightly behind middle; meso and metanotum not appreciably dilated at the posterior ventral margin and without any marked indication of wing pads. Hind femora long and narrow. Colour dull white with darker markings, the sides with a wide dull brown lateral line; eyes creamy-white, unspotted (see fig. 1). Length of antennae 2.5 mm., hind femora 3.5 mm., hind tibiae 3.2 mm.

Second Instar.—Antennae with 17 segments, acuminate, pedicle flat above, keeled below, the club laterally rounded, tapering to a blunt point. Head structures as before; median carina of pronotum entire or finely divided at posterior third; lateral carinae slightly constricted at middle; wing pads indicated by projections of the meso and metanotum. Colour much as in previous instar, dorsal area sparingly brown spotted; there is a dull brownish line on the sides extending brokenly almost to tip of abdomen, below this on abdomen are a series of oblique lines, one to a segment, and a row of dark spots; lower half of abdomen and ventral surface white. Hind femora with a row of dark spots down centre of outer face, a row on the bordering carinae and on the margin of the outer flanges, lower third of tibiae black, hind tarsi white. Length of antennae 4 mm., hind femora 4 mm., hind tibiae 4.5 mm.

Third Instar.—Antennae with 20-21 segments, widest on 3 and 4 tapering apically. Head structures much as before; median carina of pronotum cut behind middle; posterior margin of pronotal disk transverse; wing pads and tegmina short, upturned. General colour ash-grey sparingly streaked and spotted with dull brown; hind tarsi pale with a few large dark spots. Length of antennae 6 mm., hind femora 9 mm., hind tibiae 8 mm .

Fourth Instar.—Antennae with 23 segments 3-8 widest, 9-14 sub-equal, narrower, flat above, the remainder laterally rounded, acuminate. The general structure now resembles an adult sufficiently close to associate it with the species. Median carina of pronotum cut at middle, hind angles of disk slightly convex; wing pads semi-horizontal; colours as before, the hind tibiae and tarsi less contrasting. Occasionally, instead of the usual white color, an individual may be reddish brown; the variation is nearly always confined to the females. An additional molt is not uncommon although, as a rule, it is confined to the female.

The following comparative table indicates some of the more striking differences between this species and its nearest ally, *Chlocaltis consperca*:—

C abdominalis Thom.	*C. consperca* Harr.
Head abnormally large, median carina of pronotum high, the lateral carinae converging posteriorly.	Head of medium size. Median carina of pronotum low, lateral carinae parallel.
Hind femora unusually long.	Hind femora normal.
Colour ashy-white, the dorsal area not contrastingly different, hind tarsi almost pure, transparent, white.	Colour dull olive, the dorsal area contrastingly paler, hind tarsi dull white or yellowish.

This table is prepared from first instar nymphs but, allowing for certain variations due to development, it may be used successfully for any period of the immature life. A further mark of identity, useful in the field, may be observed in the rather peculiar habit of this grasshopper in waving its hind legs in the air before finally taking hold of a support. This at once draws attention to what we have referred to as the black socks and white shoes.

NOTES ON THE DISTRIBUTION OF COLEOPTERA IN FLORIDA WITH NEW ADDITIONS TO THE KNOWN FAUNA OF THAT STATE.

BY W. S. BLATCHLEY,

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My last paper on the Coleoptera of Florida was prepared in the autumn of 1927, and published in the Canadian Entomologist for March, 1928. I spent the winter of 1927-28 in California and did not return to Florida until November, 1928. During the winter of 1928-29 circumstances were such that I did little collecting, and that only about Dunedin, until March, when I made a visit to Gainesville, Fla. While there I was in the field every day with Prof. J. R. Watson, A. N. Tissot and H. E. Bratley. Later in the month I made a fifth visit to Royal Palm Park for a period of ten days. While at Gainesville (and on a preceding visit there in February, 1927) I secured a number of very interesting beetles, as the Coleopterous fauna of that section of the State, especially among the smaller species, has not been well worked up. A number of these and also some of those taken on the last trip to Royal Palm Park (20 in all) had not before been recorded from the State, while new station records for many others were secured. It is of these and a few others which have been on hand for some time, but not previously determined as to name, that the present paper deals.[1] My thanks are due H. C. Fall, Tyngsboro, Mass., Chas. Schæffer, Brooklyn, N. Y. and L. G. Gentner, East Lansing, Mich., for aid in verifying or naming a number of the species.

(1082). *Fenestria morio* (Dej.)—By its smooth, shining unstriated elytra this beetle is easily separated from its close allies. It is recorded only from Alabama and Florida. In the latter state it is very scarce, only a half dozen having been taken by me in 17 years' collecting. Two were taken in dense woodland at Gainesville, March 6, from beneath a thick layer of leaf mold at the base of a large magnolia; two others in recent years at Dunedin from beneath bunches of Spanish moss in open pine woods.

(1666). *Lebia lobulata* Lec. One was taken at Gainesville, March 6, by sifting leaf debris on the border of the Experiment Station gardens. The only other Florida record is that of Schwarz, as "Enterprise, rare."

(1760). *Pentagonica flavipes* (Lec.). Two were taken at Dunedin, February 5, by sifting weed debris at the border of a hammock. It also is a rare species, 44 years' collecting having yielded me but six specimens, three from northern Indiana and three from Florida. There are three color forms, the ones from Indiana being piceous with legs and thorax yellow, those from Florida (as

1.—In it the sequence, and for the most part the nomenclature, is that of Leng's "Catalogue of the Coleoptera North of Mexico" (1920), or the Supplement thereto (1927), and the number in parenthesis before each species mentioned is the serial number of that species in one or the other of these two works.

was Leconte's type from Louisiana)[2] wholly piceous with pale legs while his variety *bicolor* [3] from the "Western States" is piceous, with the head, thorax and legs "rufo-testaceous."

(2329). *Peltodytes floridensis* Math. Two were taken, March 9, from a pool in the Prairie Creek bottoms near Gainesville. Originally described from Sanford and recorded elsewhere only from near Dunedin and Okeechobee City.

(19172). *Bidessus subsericeus* Blatch. Several examples were taken at Gainesville, March 6, from the border of a pond on the University grounds. Described from Dunedin, Kissimmee and Okeechobee City, Fla. and not recorded elsewhere.

(3009). *Anisotoma obsoleta* (Melsh.). This is evidently a scarce species. which has a wide recorded distribution across the United States, but has not before been recorded from Florida. One was taken at Dunedin March 13, 1929, at light at my desk.

(——). *Corylophodes flavo-ocellus* Blatch. This minute species was described[4] from Royal Palm Park. A specimen at hand was taken at Ft. Myers, February 24, by sweeping the flowers of St. Peter's-wort, *Ascyrum tetrapetalum* (Lam.).

(3938). *Biocrypta magnolia* Blatch. Originally described[5] from Gainesville, this Staphylinid has since been taken sparingly at Dunedin and in numbers at Royal Palm Park. It occurs in winter beneath bunches of weed debris along the borders of ponds and ditches and at the Park was beaten from dead decaying leaves of the Royal Palm in the dense hammock on Paradise Key.

(6396). *Nanosella fungi* (Lec.). Numerous examples of this, one of the most minute of North American beetles, were received from J. R. Watson and A. N. Tissot of Gainesville. They were taken November 29 by passing particles of a fungus, *Daedalea ambigua* Berkley, through a Berlese funnel, and again on December 7 from debris from beneath a mixed growth of trees passed through the same funnel. The species has hitherto been recorded only from specimens taken at Atlanta, Georgia, by Motschulsky in 1854.[6]

(6723). *Paromalus aequalis* Say. One taken at Dunedin, January 22, from beneath bark of sweet gum. Not before recorded from the State except from Gainesville, where H. L. Dozier found it in numbers in February and March beneath bark of fallen oaks.

(6728). *Isolomalus seminulum* (Er.). Two specimens are at hand, one taken March 1, at Dunedin, the other at Gainesville, March 8, from beneath oak bark. Recorded only from Palatka, Enterprise and St. Augustine.

(19456) *Bacanius subdepressus* Blatch. One taken near Gainesville, March 7, from beneath bark of oak log. Recorded heretofore only from Dunedin, the type locality, where it occurs frequently beneath bark and cow dung.

2.—Trans. Amer. Phil.. Soc. (2) X, 1853, 377.
3.—New Spec. N. Amer. Coleop., I, 1863, 7.
4.—Ent. News, XXXVII, 1927, 139.
5.—Can. Ent., XLIX, 1917, 236.
6.—For an interesting account of this beetle and its nearest allies see Barber, H. S., Proc. Ent. Soc. Wash., Vol. 26, 1924, pp. 167-178.

(7605). *Enoclerus ichneumoneus* (Fabr.). This handsome Clerid was recorded in the Schwarz List from Haulover as "very rare," and in his Ms. notes from Key West. In 1910 A. B. Wolcott described[7] the color variety *knabi* from Marion Co., Fla. I did not take it in the State until Feb. 21, 1927, when one was beaten from holly in low ground open woods along Hogtown Creek near Gainesville. A second example was beaten from a bunch of Spanish moss in the same woods on March 8, 1929. These specimens are larger (11.2 mm.) than those from Indiana (8 mm.) and probably represent var. *knabi*, as the apical fourth of elytra has a narrow pale reddish cross-bar separating a broader black one from the triangular subapical black spot.

(7698). *Neichnea laticornis* Say. My first specimen was taken March 9, by sweeping herbage in the Prairie Creek bottoms near Gainesville. It is the first record for the State. Say's type was from North Carolina, that being heretofore its most southern record.

(8332). *Dilandius unicus* Casey. A single specimen was taken March 20, near Moore Haven, by sweeping low herbage along a ditch. Originally described[8] from a unique taken at Haw Creek, Fla., and not recorded elsewhere.

(8335). *Tomoderus impressulus* Casey. Two specimens were taken at Gainesville, December 1, by A. N. Tissot, from a tree orchid, *Epidendrum*, on an oak. Described[9] from North Carolina; not previously recorded, from Florida.

(8463). *Anthicus sapintus timidus* Casey. Two taken in February at Dunedin, one by sifting beneath carrion trap, the other by beating Spanish moss. Originally described[10] from "Florida" without definite station, not recorded elsewhere. Mr. Fall has one taken at Royal Palm Park. My specimens are straw-yellow, not "rufo-testaceous," as mentioned by Casey, but otherwise agree very well with his key and description.

(8476). *Elonus nebulosus* Lec. Three taken at Gainesville, March 5, by beating dead bay and magnolia foliage in a low ground hammock. Mentioned in the Schwarz Ms. from Centerville. No other State record.

(8484). *Zonantes fasciatus* (Melsh.) Two taken March 7, ten miles north of Gainesville, by beating foliage in a dense hammock. Known elsewhere in the State from Enterprise, St. Augustine and Jacksonville.

(——). *Monocrepidius fuscosus* Blatch. Mr. H. C. Fall has recently redescribed[11] this species under the name *M. planidiscus*, which must fall as a synonym. His specimens were from Savannah, Ga., and St. Petersburg, Dunedin and Homestead, Fla. I have taken it only at Dunedin, where it occurs frequently from January to April beneath gunny sacks and other cover in citrus groves.

(8633). *Limonius quercinus* (Say). One taken near Gainesville March 7, by beating in a dense hammock. Mentioned in the Schwarz list from Jacksonville; no other State record.

7.—Ent. News, XXI, p. 321.
8.—Ann. N.Y. Acad. Sci., VIII, 1895, p. 643.
9.—Loc. cit., p. 649.
10.—Loc. cit., p. 741.
11.—Can. Ent., LXI, 1929, 56.

(——). *Limonius semiaeneus* Lec. Numerous examples taken March 7-9, at Gainesville by beating Spanish moss, etc. Known elsewhere in the State from Ormond, Jacksonville and St. Augustine. Leng lists this as a synonym of *L. basillaris* (Say), but *semiaeneus,* as found in Florida, is a distinctly narrower less depressed form, with the entire elytra and hind angles of thorax reddish yellow, than the *basillaris* of Indiana, where the tips of the hind angles alone are pale. In *semiaeneus* these angles are also broader and less acute, and the punctures of disc of thorax more aciculate than in *basillaris*. I regard the two as very distinct species.

(9122). *Esthesopus pusio* Horn. One specimen taken March 18, at Royal Palm Park from a mass of weed debris lying beneath a bridge. Described[12] from "Florida" and mentioned in the Schwarz Ms. from Key West, Biscayne Bay and Punta Gorda.

(9133). *Deltometopus amoenicornis* (Say). Two specimens were beaten from oak March 7, near Gainesville. The only other recorded station is Enterprise by Schwarz.

(9687). *Helodes pulchella* Guer. My second Florida specimen was taken near Gainesville March 9, from beneath a bunch of pine needles in the Prairie Creek bottoms. The only other State record is that of mine from Dunedin.[13] These two specimens are exactly alike in color, and differ from northern ones in having the disk of thorax largely black. They probably represent a southern color race or variety.

(9847). *Nosodendron unicolor* Say. Taken by H. E. Bratley, June 28, 1928, from a pond near Gainesville. Not before recorded from the State. Leng gives the distribution as "Northern Illinois, Kansas and Indiana."

(10011). *Lycoptis villosa* Casey. One taken at Dunedin, December 10, from beneath bark of a decaying white bay. Described[14] from South Carolina and hitherto recorded elsewhere only from the District of Columbia.

(10094) *Epuraea umbrosa* Horn. This species was described[15] in 1879 from Fort Cobb, Indian Territory (now Oklahoma). Leng gives no other record of its distribution. Two specimens are at hand from Dunedin taken in January and March from beneath blocks of pine wood, and one from Gainesville, taken March 8 from beneath bark of oak.

(10239). *Laemophloeus adustus* Lec. One taken at Gainesville, March 8, by beating dead leaves of holly. No previous Florida record.

(——). *Pharaxonotha zamiae* Blake. Examples of this recently described[16] Cryptophagid from Royal Palm Park have stood unnamed in my collection for several years. The types of Miss Blake were from Homestead, Fla. and other points from Crescent City southward. It occurs on the flowers of the Florida arrowroot or coontie, *Zamia floridana* DC.

12.—Trans. Amer. Ent. Soc. XII, 1884, 43.
13.—Can. Ent., LX, 1928, 65.
14.—Ann. N.Y. Acad. Sci., V. 1890, 312.
15.—Trans. Amer. Ent. Soc., VII, p. 300.
16.—Psyche, XXXV, 1928, 111.

(10519). *Thrimolus minutus* Casey. One was taken at Gainesville, November 7, by J. R. Watson by passing the fungus *Fomes fasciatus* through a Berlese funnel. Another, March 8, from the same fungus. Described from Texas; recorded elsewhere only from Indiana, and as *T. duryi* Casey, a synonym, from Ohio.

Bitoma paradisea sp. nov.

Elongate, subparallel, subdepressed. Piceous-brown, the elytra dull red, with side margins, a cross bar at apical two-thirds and sutural line extending from base to this cross bar, piceous; legs and last three ventrals dull red; antennae reddish-brown, the club paler. Head three fourths as wide as thorax, strongly flattened, finely and closely granulate-punctate; eyes small, located close to thorax; basal joint of antennal club much larger than apical one, the latter bristly pubescent. Thorax subquadrate, sides straight from base to apical fifth, there incurved and partly surrounding basal half of eyes, margins distinctly but finely crenulate; disk with quadrate central portion elevated, finely and closely granulate, its outer margin formed by a sinuous raised line, the space between this and the outer margin of thorax proper, with a similar but lower raised line, the grooves (intervals between the raised lines) finely and closely granulate. Elytra equal in width to and three times as long as thorax, sides parallel from base to apical fifth, thence broadly rounded into tips; disk of each elytron with three raised lines (in addition to sutural and marginal ones), the intervals each with a double row of alternating granules. Length 1.8-2 mm.

Described from three specimens taken March 29, 1927, from beneath flakes of bark of a living wild-tamarind tree (*Lysiloma bahamensis* Benth.) growing on the side of the road running across Paradise Key, Royal Palm Park. From *B. quadriguttatus* Say, our common species in both Indiana and Florida, it differs in its smaller size, broader head, distinctive sculpture of thorax, more diffuse reddish hue of elytra and in the sutural line of elytra being entire, not bifurcate at base.

(10587). *Sosylus dentiger* Horn. One taken March 26, from light in my room at the Lodge at Royal Palm Park. It is a semitropical form, described[17] from Lower California and Santo Domingo. This is the first record for the United States. The peculiar tooth-like downward prolongations of the antennal grooves, from which the specific name was derived, are very distinct.

(10744). *Rhymbus ulkei* (Cr.). My first Florida specimen was taken by A. N. Tissot, November 29, by passing fragments of the fungus, *Daedalea ambigua* (Berk.) through a Berlese funnel. Florida stations previously mentioned are Enterprise and Crescent City.

(10753). *Endomychus biguttatus* Say. The first known Florida specimen of this handsome Endomychid was taken near Gainesville, March 8, from beneath the bark of an oak log. From Indiana specimens it differs in having the elytra a darker red, with front spot very small, hind one much larger, and punctuation distinctly coarser. It probably represents a southern race. The typical form has been recorded from New England to Iowa and Kansas, but in the south only by Summers[18] from Louisiana.

17.—Proc. Am. Phil. Soc. XVII, 1878, 582.
18.—Bull. Buff. Soc. Nat. Hist., II, 1874, p. 99.

(11112). *Scymnus myrmidon* Muls. No definite published station record for the State can be found. Schwarz mentions it in his Ms. from Punta Gorda. I have three specimens taken at Dunedin, February 9 and March 29, one of them [illegible] on my note book while I was writing in my bird "look-out" in the forks of a live oak in my lot.

(11120). *Scymnus stigma* Casey. Two examples are at hand, one taken at Sanford March 12, the other at Royal Palm Park, March 26, the latter by beating shrubs along the roadside. The only published record is "Florida," that of Casey's type.

(12277). *Leichenum variegatum* Kust. This species is supposed to occur only along sandy beaches of the sea. It was described from Madagascar and has been taken in this country only at Mobile, Alabama and at Dunedin. In the Experiment Station collection at Gainesville there are several specimens taken at Alachua, Fla., ten miles northwest of Gainesville from "Insect traps on cotton."

(12310). *Hoplocephala ferruginea* Lec. Under the name of *Evoplus ferrugineus* Schwarz lists this species from "Enterprise, rare in company with *Bolitotherus bifurcus* (Fab.)," and no other State record can be found. It is at hand from Gainesville, Lakeland and Dunedin, all stages having been taken near Dunedin January 25, from a woody fungus attached to a partly buried oak log.

(——). *Hypophloeus mexicanus* Reit. ? Four examples, which I tentatively refer here, were taken March 27, in company with scores of the weevils, *Brentus anchorago* Linn. and *Cossonus impressus* Boh., beneath the bark of a dead gumbo-limbo [*Elaphrium simaruba* (L.)] tree in the burned over part of the hammock on Paradise Key, Royal Palm Park. There are two similar specimens, labelled *H. mexicanus* Reit. ? in the collection of the American Museum of Natural History, taken by Mrs. Slosson at Biscayne Bay. Schwarz in his Ms. notes refers to a "*Hypophloeus* n. sp., Lake Worth (Hamilton)=*mexicanus* Champ. ?", which is perhaps the same form. The named species of *Hypophloeus* are closely related and very similar in habitus. Reitter's species was described from Central and South America, and comparisons will have to be made with his type in fixing definitely the name of the Florida form.

(12576). *Microtonus sericans* Lec. Two taken near Gainesville, March 4, and 7, by beating dead leaves of shrubs. This is the first record for the State, the range being given by Leng as "New York to Georgia."

(14253). *Anoplium nanum* Fab. Two taken at Royal Palm Park, March 23, from beneath bark of a pine log; another at hand is from Marco. It is a West Indian species which occurs only in the southern part of the State and has been usually recorded as *Elaphidion cinereum* (Oliv.), a synonym. In the Schwarz Ms. both this and the next are mentioned as occurring at Key West and Biscayne.

(14702). *Neoclytus cordifer* (Klug). Also a West Indian species, usually recorded as *N. devastator* (Cast). Two were taken at Royal Palm Park, March 23, by beating dead leaves of a recently cut wayside shrub. At Punta Gorda, on November 7, W. T. Davis found several on the foliage of a cultivated Oleander.

(14726). *Euryscelis suturalis* (Oliv.). Four were taken, March 21, at light in my room at the Lodge in Royal Palm Park. They were all males, but much smaller and with shorter, more slender hind legs than the single example

taken in the same room two years previously.[19] Recorded from Florida only from the Park and Miami; it being also a semitropical form from the West Indies.

(15188). *Amphionycha suturalis* Linell. One taken at Royal Palm Park March 24 by beating dead limbs of oak. Described from Brownsville, Texas and not hitherto recorded elsewhere.

(15307). *Griburius larvatus decoratus* (Suffr.). This is a color variety of *G. larvatus* (Newn.) in which the front half of thorax bears two large triangular black spots and the elytra two more or less interrupted black cross bars. All specimens taken at Royal Palm Park were of this variety. Those of typical *larvatus,* which occur frequently throughout the State, have the spots on thorax small and round or wanting and the elytra each have two small round basal spots and one or two near middle.

(——). *Monachulus viridanus* Fall. Four examples of this small greenish recently described[20] Cryptocephalid are at hand from Dunedin. They were taken in March and April by sweeping herbage in low wet places. The unique type was from St. Petersburgh; not recorded elsewhere.

(15771). *Diabrotica balteata* Lec. One taken at Royal Palm Park, March 23, by sweeping herbage along the border of a tomato field. A semitropical species ranging south to Central America; not before recorded from Florida, but known from Alabama, Savannah, Ga. and elsewhere in the south. It is very close to, if not a synonym of *D. speciosa* Germ. The latter is a common South American species which I took in some numbers in 1924 near Rio de Janeiro, Montevideo, Buenos Aires and Mendoza.

(——). *Oedionychus spilonota* Blake. One taken, March 7, by beating foliage of oak in a hammock nine miles northwest of Gainesville. Described[21] from Crescent City, Fla, and not definitely recorded elsewhere.

(15904). *Disonycha discoidea* (Fabr.). One swept from herbage, March 9, in Prairie Creek bottoms, near Gainesville. The first record for the State, its distribution as given by Leng being North Carolina, Texas and Indiana.

(——). *Haltica woodsi* Iseley. Two specimens were taken at Gainesville March 7, by beating bunches of Spanish moss. They differ from typical Indiana examples of *woodsi* in being purplish instead of greenish in hue, but agree in sculpture and structural characters. The general range of the species is northern, this being the first Florida record.

(16124). *Octotoma plicatula* (Fab.). This is apparently a scarce species in Florida, but two specimens having been taken by me in 17 years' collecting. They were beaten from Magnolia near Gainesville on February 21, 1927. H. L. Dozier records[22] them as occurring in March in some numbers near Gainesville on buckeye and ash. Elsewhere in the State they have been taken only at Archer, where they were taken by Kœbele, according to the Schwarz Ms.

(20226). *Systena plicata* Blatch. An example of this species, taken June

19.—See Can. Ent., LX, 1928, 70.
20.—Can. Ent. LIX, 1927. p. 139.
21.—Proc. U. S. Nat. Mus. Vol. 70, 1927, p. 36.
22.—Ent. News, XXIX, 1918, 372.

7 at Newman's Lake, near Gainesville, Fla., is in the collection of Chas. Schæffer of Brooklyn, N. Y. The species was described[23] from Posey County, in southern Indiana and has not been recorded elsewhere.

Mylabris wheelocki sp. nov.

Oblong, subquadrate, robust. Eyes, four basal joints of antennae, a broken line each side of thorax and some irregular spots on elytra dull red; tibiae, sides of last three ventrals and margin of pygidium also reddish. Eyes very large, almost approximate in front; antennae of male pectinate, the branch of joint 4 short, subulate, 5 twice as long, 6-11 longer, sub-equal. Thorax subconical, slightly wider at base than long, basal margin bisinuate, disk finely and densely granulate-punctate. Elytra conjointly subquadrate, about one-third longer than wide at base, sides subparallel, striae fine but distinct; surface, as well as that of thorax, sparsely clothed with a very short silken appressed pubescence and with reddish markings as follows: an irregular spot each side of scutellum covering the first three intervals, a common sutural spot just behind middle, a subapical line on second interval, a short line near apex of the seventh and eighth intervals, and the outer margin opposite these two lines. Pygidium perpendicular, finely and densely punctate, its upper half clothed with prostrate silvery white pubescence. Hind femora mutic. Length 1.8 mm.

Type, a male, taken March 21, 1929, at Royal Palm Park, Fla., by beating a mass of dead stems of the moonvine, *Ipomoea bona-nox* L. Belongs to Group IV of Horn[24] and Fall.[25] Allied to *M. impiger* (Horn) from Texas, Arizona and Southern California, but smaller, darker and with a very different color pattern of elytra. Named in honor of Mr. and Mrs. W. D. Wheelock, hosts of the Lodge at Royal Palm Park, who have shown me many favors during my visits to the Park.

SOME NEW DIKRANEURA (HOMOPTERA, CICADELLIDAE) WITH NOTES ON OTHER SPECIES.*

BY PAUL B. LAWSON,
Lawrence, Kansas.

Dikraneura californica sp. n.

Pl. IV, fig. 4; Pl. V, figs. 5, 5a, 5b.

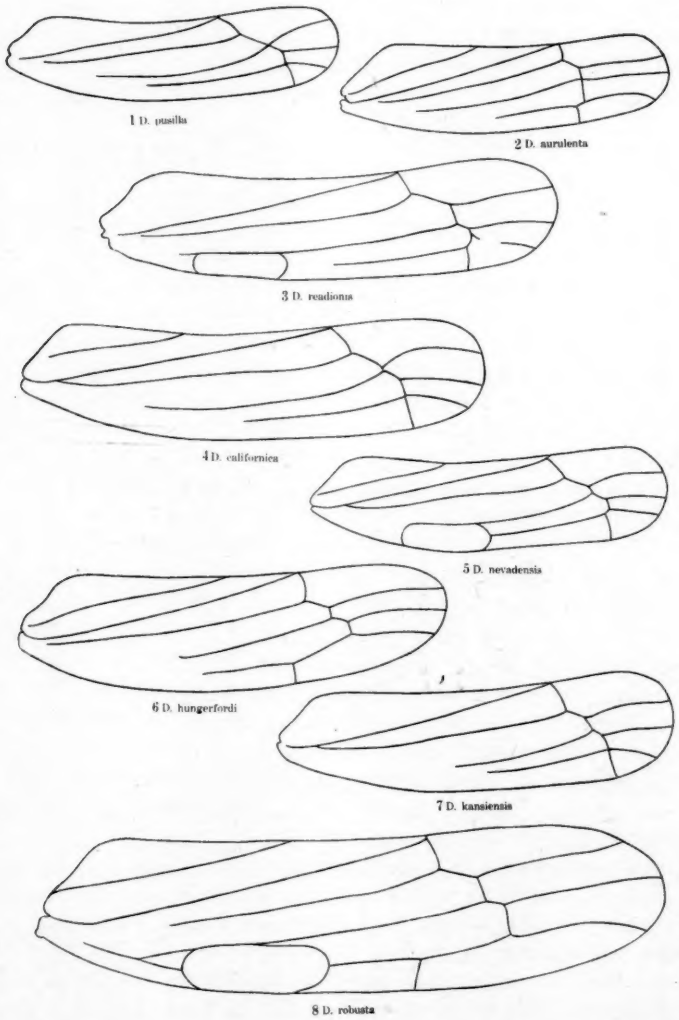
A milky-white species, sometimes tinged with yellow, with four red stripes on elytra. Allied to *D. cruentata*. Length 2.75-3 mm.

Form: Vertex distinctly wider than long, twice as long at middle as next the eye, anterior margin obtusely rounded. Pronotum one-half longer than vertex, distinctly widened posteriorly, posterior margin but slightly concave. Scutellum large. Elytra very long, greatly exceeding abdomen; apical cells progressively longer from first to the very large fourth cell. Second closed submarginal cell of hind wing triangular and small.

Genitalia: Last ventral segment of female moderately long, median third of posterior margin distinctly produced to obtuse apex which is slightly notched.

23.—Journ. N. Y.. Ent. Soc., XXIX, 1921, p. 26.
24.—Trans. Amer. Ent. Soc., IV, 1873, p. 321..
25.—Ibid. XXXVI, 1910, p. 163.
*—Contribution from the Department of Entomology, University of Kansas.

CAN. ENT. VOL. LXII. PLATE 4.



SOME NEW DIKRANEURA

Last ventral segment of male long and nearly parallel margined; valve large, obtusely rounded apically; plates, when viewed laterally, with blunt upturned apices which exceed pygofer.

Color: Vertex, pronotum and scutellum milky white, parts of latter two hyaline. Elytra hyaline, sometimes slightly fumose apically; tips of sectors and fourth cross vein marked with fuscous; a long red spot on clavus along claval suture and a shorter one caudad of this on second sector, these spots varying greatly in size and depth of color. Underside pale except for dark tarsal claws and black tip of ovipositor.

Described from a female and a male, holotype and allotype respectively, from Giant Forest, California, 7/28/29. Paratypes are at hand from Giant Forest, same date; Marin County, California, 8/3/29; Alpine, California, 7/9/29. All types taken by Dr. R. H. Beamer.

Types deposited in Snow Entomological Collection.

Dikraneura californica var. **imbellis** var. n.

Like the above except that the four red spots on the elytra are entirely lacking. As in the typical form the apices of the sectors and the fourth cross vein are distinctly darkened, as are the tarsal claws and the tip of the ovipositor.

Described from a male and a female, holotype and allotype respectively, taken at Giant Forest, California, 7/28/29. A large series of paratypes are at hand from Giant Forest, same date; Marin County, California, 8/3/29; Alpine, California, 7/9/29; Strawberry, California, 8/8/29. All types taken by Dr. R. H. Beamer.

Types deposited in Snow Entomological Collection.

Dikraneura pusilla sp. n.

Pl. IV., fig. 1; Pl. V., figs. 2, 2a, 2b.

A small white species sometimes tinged with yellow, feebly marked with red. Allied to *D. cruentata* but smaller and with more pointed head. Length 2.25 mm.

Form: Vertex about as long as wide, twice as long at middle as next the eye, anterior margin strongly angulate. Pronotum a little longer than vertex, about twice as wide as long, lateral margins long. Scutellum large. Elytra very long, greatly exceeding abdomen; apical cells increasing in size from the first to the very large fourth cell. Second closed submarginal cell of hind wing triangular and small.

Genitalia: Last ventral segment of female long, posterior margin produced to obtuse apex. Last ventral segment of male large; valve short, with distinct lobe on median third; plates with wide, produced, upturned apices which strongly exceed the pygofer.

Color: Milky to yellowish white. Vertex with median red stripe. Pronotum and scutellum with two parallel red stripes. Large red stripe on clavus next to claval suture and a smaller one caudad of this on second sector. Eyes and tips of sectors and fourth cross vein darkened. Front with narrow red band between the eyes. Tarsal claws and tip of ovipositor black. All red spots more or less indistinct at times and fading out to yellow.

Described from a female and a male, holotype and allotype respectively, and three female and three male paratypes. All specimens taken in Cameron County, Texas, 8/3/29, by Dr. R. H. Beamer.

Types deposited in Snow Entomological Collection.

Dikraneura nevadensis sp. n.

Pl. IV., fig. 5; Pl. V., figs. 4, 4a, 4b.

A small yellow species marked with bright red. Allied to *D. californica* but smaller and brighter. Length 2.5 mm.

Form: Head distinctly narrower than pronotum. Vertex a little wider than long, scarcely twice as long at middle as next the eye, anterior margin obtusely rounded. Pronotum one-third longer than vertex, about twice as wide as long, distinctly widened posteriorly, lateral margins long. Scutellum normal. Elytra very long, greatly exceeding abdomen; apical cells increasing in size from the first to the very large fourth cell. Second closed submarginal cell of hind wing triangular and fairly long.

Genitalia: Last ventral segment of female moderately long, about twice as long as preceding segment, median third of posterior margin produced into a rounded lobe. Last ventral segment of male large, with posterior margin slightly concave; valve distinct, with large median lobe; plates, viewed ventrally, ending in acute tips which are somewhat upturned and exceed the pygofer.

Color: Bright lemon yellow except for large scarlet stripe on clavus along claval suture, and a smaller one caudad of this on second sector. Tips of sectors, the second one less so, and fourth cross vein darkened, as also are tarsal claws and tip of ovipositor.

Described from a male and a female, holotype and allotype respectively, and a male and two female paratypes, all taken at Carson City, Nevada, 8/9/29, by R. H. Beamer.

Types deposited in Snow Entomological Collection.

Dikraneura kansiensis sp. n.

Pl. IV., fig. 7; Pl. V., figs. 7, 7a, 7b.

A small milky-to-yellowish-white species. Allied to *D. nevadensis* but larger and marked with two smaller and two longer posterior spots or lines on elytra. Length 2.75-3 mm.

Form: Head distinctly narrower than pronotum. Vertex slightly wider than long, twice as long at middle as next the eye, anterior margin obtusely rounded. Pronotum one-half longer than vertex, nearly twice as wide as long, humeral margins quite long, posterior margin shallowly concave. Scutellum normal. Elytra long, greatly exceeding abdomen; apical cells increasing in size from the short first cell to the very large fourth cell. Second closed submarginal cell of hind wing triangular, nearly as long as first submarginal cell.

Genitalia: Last ventral segment of female moderately long, posterior margin somewhat sinuately produced medially. Last ventral segment of male large; valve wide, slightly produced medially; plates with acute upturned apices which strongly exceed the pygofer.

Color: Milky to yellowish white. Vertex, pronotum and scutellum usually entirely pale but in well colored specimens with a faint red median line on vertex, two lines on pronotum and the scutellum red. Eyes darker. Elytra with branches

of first sector and fourth cross vein darkened and with a wide smoky area on either side of cross veins; a large scarlet spot across middle of clavus and a larger scarlet line caudad of this, extending along second sector to the cross veins, with sometimes a small scarlet spot laterad of this. Tarsal claws and tip of ovipositor black.

Described from a female and a male, holotype and allotype respectively, and a series of paratypes, all taken by Dr. R. H. Beamer on jewell weed in Douglas County, Kansas, 5/27/28, except for two paratypes taken 5/1/26.

Types deposited in Snow Entomological Collection.

Dikraneura readionis sp. n.

Pl. IV., fig. 3; Pl. V., figs. 1, 1a, 1b.

A milky-white to yellowish-white species allied to *D. debilis* but larger. With distinct dark spot in first apical cell and smoky cloud in fourth. Length 2.75-3 mm.

Form: Head slightly narrower than prothorax. Vertex somewhat wider than long, one-half longer at middle than next the eye. Pronotum distinctly longer than vertex, about twice as wide as long, lateral margins long, posterior margin shallowly concave. Scutellum moderately large. Elytra very long, exceeding abdomen in the males by half their length; apical cells increasing in size from the first to the very large fourth cell. Second closed submarginal cell of hind wing triangular, distinctly smaller than first submarginal cell.

Genitalia: Last ventral segment of female moderately long, posterior margin produced medially and bearing a short but wide median notch. Valve of male large, posterior margin nearly straight; plates finger-like, enlarged basally, then constricted and bent mesad; oedagus always plainly visible between plates.

Color: Milky white to distinctly yellow in better colored specimens; a distinct round black spot in first apical cell and in well marked specimens a small black spot cephalad of this in costal cell, also a larger indistinct smoky spot in fourth apical cell; apices of sectors not darkened. Eyes darker. Tarsal claws and tip of ovipositor black.

Described from a female (holotype) taken in Pima County, Arizona, 7/28/27, by Dr. P. A. Readio, in whose honor the species is named. Allotype, same data; except for date, July 27, 1927. A large series of paratypes is at hand from the same county, taken by the same collector and from Gila and Yavapai counties, Arizona, taken by Dr. R. H. Beamer. Mr. A. A. Nichol also took three paratype specimens at Tucson, Arizona.

Types deposited in Snow Entomological Collection.

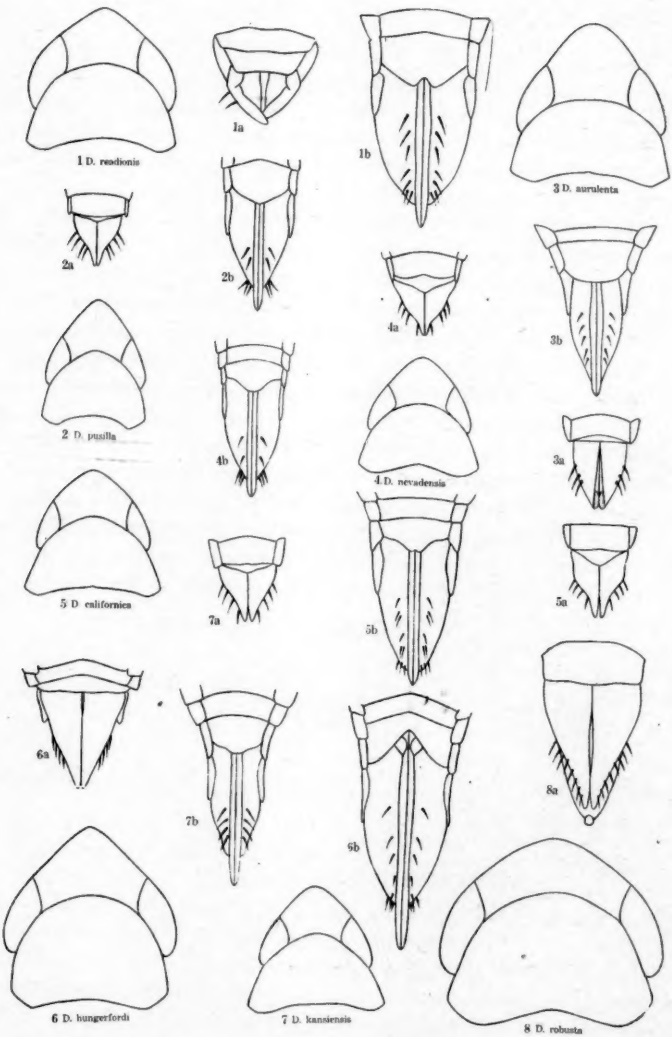
Dikraneura hungerfordi sp. n.

Pl. IV., fig. 6; Pl. V., figs. 6, 6a, 6b.

A robust brownish-green species, sometimes tinged with reddish. Allied to *D. mali* but with distinct genitalia. Length 3-3.25 mm.

Form: Head wider than pronotum. Vertex distinctly wider than long, scarcely twice as long at middle as next the eye in female, shorter in male, anterior margin obtusely angulate. Pronotum distinctly longer than vertex, less than twice as wide as long, lateral margins a little longer than humeral margins, posterior margin shallowly concave. Scutellum rather small. Elytra strongly exceeding abdomen; first and fourth apical cells about equal, distinctly longer

CAN. ENT. VOL. LXII. PLATE 5.



SOME NEW DIKRANEURA

than second and third cells. Second closed submarginal cell of hind wing as long as first.

Genitalia: Last ventral segment of female with a large median excision extending half way to the base; ovipositor strongly exceeding pygofer. Valve of male broad, posterior margin practically straight; plates large, apices acute, exceeding pygofer.

Color: Usually dull or brownish green, two specimens tinged with reddish. Abdomen usually black except for last ventral segment, pygofer and ovipositor.

Described from a male and a female, holotype and allotype respectively, taken at Douglas Lake, Michigan, July 20, 1925, by Dr. H. B. Hungerford, in whose honor the species is named. Two paratypes bear the same data except that the date on one is August 14, 1925. Another female paratype is from Brockville, Ontario, August 5, 1903, taken by W. Metcalfe.

Types deposited in Snow Entomological Collection.

Dikraneura robusta sp. n.

Pl. IV., fig. 8; Pl. V., figs, 8, 8a.

A robust greenish-yellow species allied to *D. mali*. Length 4 mm.

Form: Head wider than pronotum. Vertex over twice as wide as long, but slightly longer at middle than next the eye, anterior margin not at all angulate and broadly rounded with front. Pronotum twice as long as vertex, less than twice as wide as long, lateral margins short, humeral margins longer, posterior margin broadly concave. Scutellum relatively small. Elytra long, exceeding the abdomen by nearly half their length; first apical cell longest, followed by fourth, third and second. The two closed submarginal cells of hind wing of about the same length.

Genitalia: Valve very large, posterior margin practically straight; plates long, the moderately acute apices nearly equalling pygofer.

Color: Uniformly greenish yellow, abdomen mostly black. Eyes dark and disk of pronotum showing through dark.

Described from a male (holotype) taken at Creede, Colorado, August 1914. Altitude 8844 ft.

Types deposited in Snow Entomological Collection.

Dikraneura aurulenta sp. n.

Pl. IV., fig. 2; Pl. V., figs. 3, 3a, 3b.

A small golden-brown species allied to *D. marginella* but lacking brown marginal line on vertex. Length 2.5 mm.

Form: Head strongly flattened. Vertex about as long as wide, twice as long at middle as next the eye; apex obtusely rounded in female, somewhat more acute in male. Pronotum about as long as vertex, twice as wide as long, moderately widened posteriorly, posterior margin broadly but distinctly concave. Scutellum large. Elytra moderately long; first and fourth cross veins somewhat cephalad of second and third. Second closed submarginal cell of hind wing triangular and small.

Genitalia: Last ventral segment of female moderately long, posterior margin broadly convex. Last ventral segment of male rather long, nearly covering valve; plates longer than pygofer, the broad apices upturned.

Color: Vertex russet brown except for white marginal band and white irregular basal spots. Eyes black. Pronotum russet brown with irregular white spots along anterior margin. Scutellum russet brown with two longitudinal white lines and irregular white spots. Elytra uniformly golden yellow with just a suggestion of a lighter line along claval suture. Underside russet brown or yellow, with tip of beak, tarsal claws and ovipositor black. Sometimes dorsum and venter of abdomen are darkened.

Described from a female and a male. holotype and allotype respectively and five paratypes. All types taken in Cameron County, Texas, 8/3/28, by Dr. R. H. Beamer.

Types deposited in Snow Entomological Collection.

Dikraneura debilis McAtee.

A specimen of what seems to be this species is at hand from Cameron County, Texas, taken 8/3/28, by Dr. R. H. Beamer. This specimen was sent to Mr. McAtee who kindly compared it with a type specimen and reported that it agreed very well. This, therefore, records this species from the United States.

Dikraneura rufula Gillette.

A number of specimens of this species are before the writer from Marin County, California, and from the Giant Forest, California, and in addition, two specimens from Provo, Utah. The writer agrees with Ball and DeLong that this is a distinct species rather than a variety of *D. abnormis*.

Dikraneura kunzei Gillette.

A series of specimens of this species are at hand from Valentine, Texas, and from Gila County and the Huachuca Mountains, Arizona.

Dikraneura maculata Gillette.

A very large series of this species is at hand from the following localities: Iola, Kansas, and Douglas County, Kansas; Pinal and Gila counties, Arizona; Sutton, Cameron and Menard counties, Texas; Zion National Park, Utah. Dr. R. H. Beamer, who collected all these specimens, reports that they were taken on hackberry. McAtee has already reported this to be the host in North Carolina. In most of these specimens the face is not marked with dark spots as called for in the original description. However, in some specimens from Kansas the dark facial markings are all present and the gradual shading off to the unmarked face can easily be traced in a series of specimens. A study of this series convinces the writer that *Dikraneura celtidis* Osborn, is a synonym of this species.

THE NYMPH OF THE MAYFLY GENUS CINYGMA EATON.

BY F. P. IDE,
Department of Biology, University of Toronto.

In early June of the summer of 1928 an immature nymph of the genus *Cinygma* was dredged from the sedges along the edge of a mill pond at Horning's Mills, Ontario. All attempts to get more material here were unsuccessful. Next year, however, on June 7, I met with some full-grown nymphs in a deep rock-pool by the edge of a stream which flows into Lake Nipissing, Ontario from the south. About fifteen individuals were reared between the 10th and the 20th of June and the species proved to be *Cinygma bipunctata* McD.[1] The description of the type fits these individuals very well.

1.—McDunnough, 1924. Occ. Papers Boston Soc. Nat. Hist., vol. 5.

In 1927 Dr. J. G. Needham described the nymph of *Cinygma mimus* Eat. under the name *Rhithrogena mimus*[2]. He found the nymph of this species to be so very similar to that of *Rhithrogena* that he decided to discard the name *Cinygma* altogether and apply the name *Rhithrogena* to the species of this genus. In the following description it will be noted that there are good characters on which to separate *Cinygma bipunctata* McD. from *Rhithrogena* and therefore it seems advisable to retain the name *Cinygma* for this species and others having similar characters.

I wish to thank Dr. E. M. Walker of the Department of Biology, University of Toronto and Dr. J. H. McDunnough of the Entomological Branch at Ottawa for advice and helpful criticism in connection with this paper.

NYMPH. Length of body 7.5-9.5 mm., caudal setae 7 mm.

Majority of individuals rather dark reddish brown; occasional specimens pale.

Head:—Depressed; eyes dorsally placed; anterior border of head somewhat emarginate towards the mid-line, exposing the tip of the labrum. Colour brown with pale markings on edge of frons in front of eyes, a median pale spot on anterior edge of frons, a median narrow pale line on the vertex reaching anteriorly to a narrow transverse pale line following the frontal suture to the eyes; pale areas over the three ocelli; first two joints of antennae white, the remainder brown in the proximal fourth, paler distally. Labrum hairy. Mandible as in fig. 3; prostheca more highly developed than in most genera of the Heptageniidae. Maxilla as in fig. 4, differing greatly from that of any other known mayfly nymph; maxillary palpus more than six times the length of the lacinia and composed of two segments, the first segment about twice the length of the lacinia and extending dorsally and posteriorly between the head and the pronotum (see fig. 1), second joint more than four times the length of the lacinia, curved and provided with long moveable setae arranged in two rows, thus forming a basket-like apparatus; bristles on the lateral border of the lacinia not pectinated. Labium as in fig. 5; glossae and paraglossae not modified as they are in most genera of the Heptageniidae; labial palpus of two segments, proximal segment about as long as the paraglossa, distal segment about 1.5 times the proximal one; distal segment concave along its medial surface and armed with long moveable bristles.

Thorax:—Prothorax brown with narrow median pale line and broader pale lateral borders. Mesothorax brown with narrow pale median line which expands slightly in the anterior half of the segment and also on the scutellum. Wing pads attaining middle of 4th abdominal segment, brown with pale areas on the shoulders and between the main veins. Metathorax brown with a median pale line. Legs pale; femora with a broad brown irregular band near proximal end and a somewhat narrower one near distal end; tibiae with a brown band proximally and another brown band extending from middle to distal fourth; tarsi with brown bands at proximal and distal ends. Femora with weak spines along anterior and posterior edges.

Abdomen:—Brown dorsally with a median pale line expanding towards the posterior border on each of segments 3-10. Posterolateral spines visible from

2.—Needham, J. G., 1927, The Canadian Entomologist, vol. LIX, No. 6, pp. 133-136.

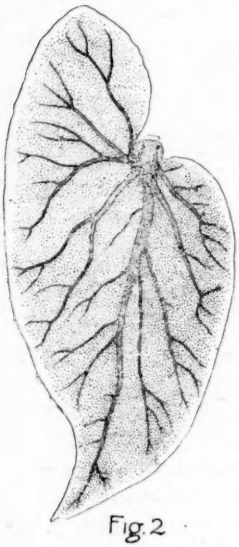


Fig. 2

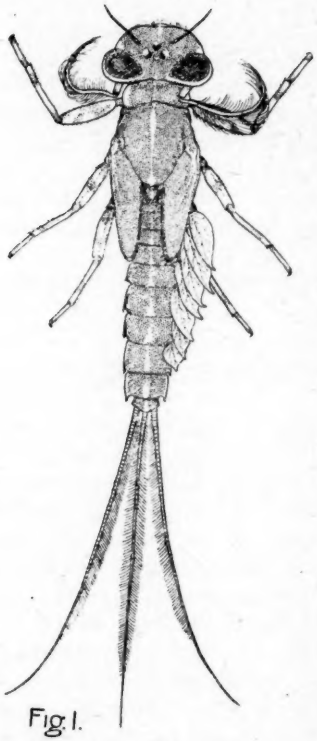


Fig. 1.

Fig. 3

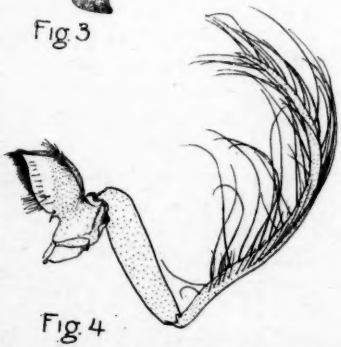


Fig. 4

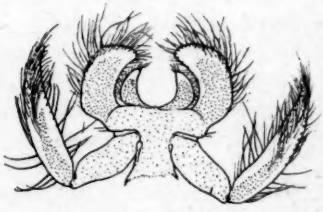


Fig. 5

Fig. 1. *Cinygma bipunctata* McD. Nymph with gill lamellae of left side removed. Fig. 2. Third gill lamella of left side. Fig. 3 Left mandible, ventral aspect. Fig. 4. Left maxilla. Fig. 5. Labium.

above on segments 5-9; longest on segment 9 where they equal two-thirds the length of segment 10. Lateral edges of segments pale with a dark brown band traversing the pale area diagonally from the inner anterior corner to the attachment of the gills; on segment 8 dark band is not pronounced and is absent from segment 9. Gill lamellae single and produced in an anterior lobe as shown for the left lamella of segment 3 in Fig. 2; anterior lobe less extensive in the gill of the first segment; tracheae of gills palmately branched, but one trachea, the one to the apex, much more prominent than the others and pinnately branched. Caudal setae brown, the median one darker brown than the others when viewed with reflected light; joints of setae marked with darker brown; lateral setae fringed on inner side only.

In discussing Eaton's genus *Cinygma* Dr. McDunnough says, "It is possible that the generic name *Cinygma* may fall to *Iron* Eaton, but for the present I am retaining it in Eaton's sense for those species in which the first tarsal joint in the male anterior legs is long but yet noticeably shorter than the second joint[3].

A consideration of nymphal characters seems amply to warrant this separation of the genus *Cinygma* from *Iron*. The fact that the nymph of *Iron* has but two caudal setae and *Cinygma* three well developed caudal setae seems in itself enough to separate the two. The mouth parts of this nymph combine characters of several genera of the family Heptageniidae (Ulmer's suborder Heptagenioidea) a point which indicates that this genus is an ancestral type within the group. A well developed prostheca of the mandible, a structure which is characteristic of the Baetidae and found in *Metretopus* and *Siphloplecton* of the Heptageniidae, is present in this nymph. Further, the maxilla is very like that of *Siphloplecton* except that the palpus consists of two joints instead of three. The two-jointed condition of the maxillary palpus shows an affinity with *Rhithrogena, Iron* and *Epeorus,* the three-tailed condition indicating a closer affinity with *Rhithrogena* than with *Iron* or *Epeorus.* The genus *Cinygma,* it would seem, has its origin near the base of the Ecdyonurine (Ulmer's Ecdyonuridae) branch of the family Heptageniidae and is most closely related to the genus *Rhithrogena.* These two genera show many minor differences correlated with the vastly different nature of the habitats.

This nymph would appear to be an offshoot from a stock adapted to life in rapid water. It reveals this in the more fundamental features of its structure, especially in the depressed head capsule and dorsal position of the eyes, also, perhaps, in the fact that it has but two segments in the maxillary palpus. In the present habitat, quiet waters, it shows retrogression in the loss of the pronounced limpet-like form of body and in the simpler form of the terminal lobes of the labium. The nymphs were seen crawling around on the vegetation in the manner of some of the Baetidae. Just what function the peculiarly modified labial palpi take on in this new environment is not known but it is conceivable that they might be used as rakes to stir up the surface of the substratum and entrap food organisms.

3.—McDunnough, 1924, Can. Ent., vol. 56, p. 130.

INTERNATIONAL SOCIETY OF IPIDOLOGISTS

At the session of the forest-entomological section of the International Congress of Forest Experiment Stations held at Stockholm in July 1929, Dr. P. Spessivtseff, Experimentalfaltet, Sweden, proposed the forming of an International Society of Ipidologists. He stressed the facts that interest in systematic and biological studies of the bark beetles had greatly increased in the past ten years but that owing to the absence of up-to-date keys to the species, the frequent inaccessibility to many students of descriptions of new species and type material, and the inadequacy of many of the descriptions, work in this group was much hampered. He advocated the formation of a committee to undertake the work of organizing this new society, and to enlist the co-operation of as many of the investigators as possible who are working on bark beetles.

The above proposal was unanimously adopted and the following members chosen to form the organizing committee:

Dr. V. von Butovitsch, Förstliche Hochschule, Eberswalde, Germany.

Dr. N. A. Kemner, Lund University, Sweden.

Dr. P. Spessivtseff) Entomological Department, Swedish Forest
)
Prof. Dr. I. Tragardh) Experiment Station, Experimentalfaltet, Sweden.

All those interested in bark beetles and desirous of joining the new society are requested to forward their names and addresses, with a statement of their more special interests, to Dr. I. Tragardh, Experimentalfaltet, Sweden. Lists of the members will be published regularly in "Entomologische Blatter" Berlin, and in other journals.

MAILED MONDAY, MARCH 10TH, 1930.